# NATIONAL BOARD FOR TECHNICAL EDUCATION (NBTE)

# COURSE MATERIAL

## FOR

## Course Code & Title: COM 112 INTRODUCTION TO DIGITAL ELECTRONICS

## Programme: NATIONAL DIPLOMA IN COMPUTER SCIENCE

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# COURSE STUDY GUIDE

## i. Course information

Course Code: COM 112

Course Title: Introduction to Digital Electronics

Credit Units: 2 Credit Units

Year of Study: One

Semester: First

## ii. Course introduction and description

Introduction to Digital Electronics class introduces you to the meaning, definition principles and use of digital electronics concepts as well as its applications to computer system process. In this course you will learn about the basic building blocks of every computing machine out there in today's world i.e. Gates (AND, OR, NOR, NAND, XOR etc.), though these are very basics of Digital Electronics, which will be covered in first few chapters of your courseware.

You will learn about the Number systems, especially binary system, the only system which computers or any computing device understand. As you proceed further in your Digital Electronics course you will learn about Boolean algebra and Boolean functions, later on in your course you will learn about the beauty of Karnaugh map (the way to simplify any complex Boolean function) which is nothing but how the size of any complex switching circuit can be reduced to smaller switching circuit without any effect on the output. You will also learn about decoders, encoders, multiplexers, de-multiplexers, counters etc.

In computer science it is very essential to have a basic idea about the Digital Electronics. Once you have a good command over the concepts of Digital Electronics, those concepts will help you to learn more advance topic like Computer Architecture, Operating Systems**.**

## iii. Course prerequisites

This course has no prerequisites; it is a first-year course.

Course learning resources

- Digital Fundamentals, Thomas L.Floyd(2008),10th Edition, Prentice Hall
- Optional readings and other resources:
- https://www.mepits.com/tutorial/29/Digital-Electronics/Logic-Families---TTL,-CMOS,-ECL
- http://www.electronics-tutorial.net/digital-logic-families/
- http://www.allaboutcircuits.com/textbook/digital/
- http://am.renesas.com/edge_ol/engineer/05/index.jsp

## iv. Course outcome

On completion of this course, the students should be able to

1. Describe number system, codes and code conversion
2. Explain the fundamentals of Boolean algebra
3. Describe the logic gates
4. Perform addition operations in the computer
5. Identify small-scale Integrated Circuit.
6. Illustrate the concept and methodology of sequential circuit design
7. Describe counters and
8. Discuss data transfer methods in registers

## v. Activities to meet course objectives

The Course Material is written in a simple, clear and concise manner that will assist and enable you to understand this course very well. Digital Electronics is an area where many people want to study because it is multidisciplinary in nature and it cut across so many disciplines in engineering and Computer Science.

Relevant sites and standard references have been provided for you. There will be individual assignments and group assignments. All assignments are due at the times slated. No late assignment will be entertained or accepted from you and hence, be very serious with your study. Completion and timely submission of assignments will also serve as part of your assessment. You are expected to read this course material thoroughly and understand very well. Thank you and God bless.

## vi. Time (to complete the syllabus)

Duration of tutoring is 12 Weeks and you shall be expected to put in a minimum of 2-hour study time weekly.

## vii. Grading criteria and scale

Grades will be based on the following:

| | |
|---|---|
| Individual Assignments/Test (CA 1, 2 etc.) | 20% |
| Group Assignments (GCA 1, 2 etc.) | 10% |
| Discussions/Quizzes/Out of class engagements etc. | 10% |
| Semester Examination | 60% |
| Total | 100% |

## viii. Grading scale:

The unified grading system to be applied in scoring all course work, examinations, project, etc. is as stated on table below:

| Marked Range | Letter Grade | Weight |
|---|---|---|
| Above 75 | A | 4.0 |
| 70 – 74 | AB | 3.5 |
| 65 – 69 | B | 3.25 |
| 60 – 64 | BC | 3.0 |
| 55 – 59 | C | 2.75 |
| 50 – 54 | CD | 2.5 |

| | | |
|---|---|---|
| 45 – 49 | D | 2.25 |
| 40 – 44 | E | 2.0 |
| Below 40 | F | 0.00 |

## ix. Feedback:

The feedback measures the performances of the course material, tutor and students with respect to certain performance indicators.

Courseware based:

1. Self-assessment questions

Tutor based:

1. Discussion Forum tutor input
2. Graded Continuous assessments

Student based:

1. Online Program Assessment (Administration, Learning Resource, Deployment, and Assessment).